

CLAIMS

1. A soft magnetic material, comprising:

5 a plurality of composite magnetic particles (30) each having a metal magnetic particle (10) and an insulating film (20) surrounding a surface of said metal magnetic particle (10), and

an organic substance (40) joining said plurality of composite magnetic particles (30) together,

10 wherein said organic substance (40) has a deflection temperature under load of not more than 100°C.

2. The soft magnetic material according to claim 1, wherein a ratio of said organic substance (40) to the soft magnetic material is more than 0 and not more than 1.0% by mass.

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3. A dust core using the soft magnetic material according to claim 2, wherein a magnetic flux density when a magnetic field of 100 (oersted) is applied is not less than 1.3 (T: tesla).

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4. The soft magnetic material according to claim 1, wherein a ratio of said organic substance (40) to the soft magnetic material is more than 0 and not more than 0.5% by mass.

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5. A dust core using the soft magnetic material according to claim 4, wherein a magnetic flux density when a magnetic field of 100 (oersted) is applied is not less than 1.4 (T:tesla).

6. A transformer core using the dust core according to claim 5, wherein the ratio of

said organic substance (40) to the soft magnetic material is not less than 0.3% by mass and not more than 0.5% by mass.

7. The dust core according to claim 5, wherein

5 the dust core uses the soft magnetic material containing said organic substance (40) by not less than 0.3% by mass and not more than 0.5% by mass, and
the dust core is formed as a hollow cylinder having a height H and a wall thickness T, said height H being not less than 25 mm and a ratio H/T of said height H to said wall thickness T being not less than 3.

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8. A motor core using the dust core according to claim 7.

9. The dust core according to claim 7, wherein said hollow cylinder has an outer diameter of not less than 30 mm.

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10. A motor core using the dust core according to claim 9.

11. A method of manufacturing the dust core according to claim 7, comprising the steps of:

20 preparing a mold (70) having an inner wall (71) and defining a compression space (72) at a location surrounded by said inner wall (71), and
putting the soft magnetic material into said compression space (72) without applying a lubricant to said inner wall (71), and compression molding the soft magnetic material.

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12. The method of manufacturing the dust core according to claim 11, further comprising the step of performing thermal treatment after said step of compression molding, at a temperature of more than a glass transition temperature of said organic

substance (40) and not more than a thermal decomposition temperature of said organic substance (40).

13. A method of manufacturing a dust core, comprising the steps of:

5 mixing a plurality of composite magnetic particles (30) each having a metal magnetic particle (10) and an insulating film (20) surrounding a surface of said metal magnetic particle (10), and an organic substance (40) having a deflection temperature under load of not more than 100°C to form a mixture, and
 compression molding said mixture to form a molding.

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14. The method of manufacturing the dust core according to claim 13, further comprising the step of performing thermal treatment on said molding at a temperature of more than a glass transition temperature of said organic substance (40) and not more than a thermal decomposition temperature of said organic substance (40).

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15. A motor core fabricated using the method of manufacturing the dust core according to claim 13.

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